

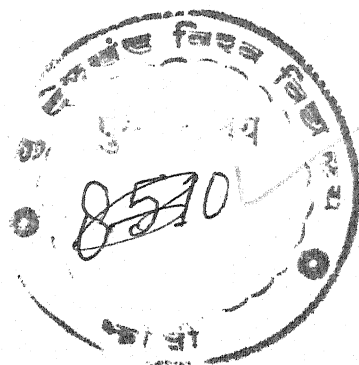
A CLINICAL STUDY OF PERCUTANEOUS FULGURATION OF VAS

THESIS

FOR MASTER OF SURGERY



BUNDELKHAND UNIVERSITY
JHANSI UTTAR PRADESH




1983

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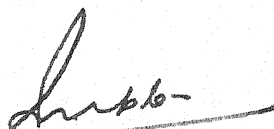
This is to certify that Dr. Narendra Singh
that has worked on " A CLINICAL STUDY OF
PERCUTANEOUS FULGURATION OF VAS" under my guidance
and supervision. His results and observations have
been checked and verified by me from time to time.

He has put in the necessary stay in the
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ACKNOWLEDGEMENT

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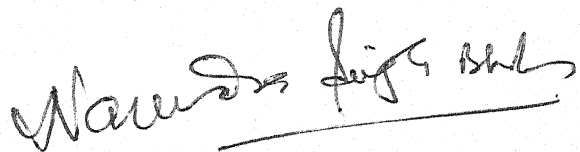
My respected teachers in the deptt. of Surgery went off of the way and very kindly permitted me to conduct this study on their cases also.

I fail in my duty if I don't appreciate the kind assistance provided by my colleagues and friends in the department of Surgery and Pathology.

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The tedious task of converting the manuscript into trans-script was done by Sri B.P. Tiwari and whatever is said to praised him, falls insufficient.

Lastly, I feel highly indebted to my parents and family members for their constant moral support.


(NARENDRA SINGH BHAT)



INTRODUCTION



INTRODUCTION

One of the first operations on vas is credited to Dr. H.G.Lennander of Upsala, SWEDEN 1897. Then Dr. Herry Sharp of Indian (U.S.A.) in 1899, vasectomized both healthy and institutionalized men for the purpose of sterilization.

At present the vasectomy is the only successful method of permanent male sterilization. In the usually practiced method, an incision is to be made, vas is exposed, cut, ligated at both ends and then skin sutured. The patient has to come for stitch removal after 7 days.

The open operation technique of male sterilization has many dis-advantages as occasional complications of infection, haematoma and associated morbidity. A segment of vas is removed and more manipulation of vas at the time of operation, reduces the success of recanalization later. Finally, the fear of an operation especially to an Indian community.

While doing routine vasectomies it was felt that the vas is very superficial structure and can be easily palpated. If we could insert a needle

in to the vas and pass an electric current through an electrosurgical cautery, the vas can be cauterized and the effect should be the same as exposure, division and ligation of the vas.

In the purposed study, a needle, which is insulated except at it's tip, was inserted into the vas under sedation. The coagulation diathermy current passed, and blocked the lumen of the vas deferens. This avoided largely open operation with its associated morbidity. There is no need of knife, blade, artery forceps, suture material etc. The only equipment required is insulated needle and electrosurgical cautery.

The patients becomes ambulatory following the procedure and resumes his routine duties, the same day. In a small series studied proved it to be the most acceptable and effective method of the male sterilization. Since a small area of vas is cauterized with least manipulation on the vas deferens, the chances of doing successful recanalization are better than in routine open vasectomies.

The method appears to be very simple and less time consuming, there is great likelihood that this may be popular to masses very quickly. The mass family planning campaign in field can be undertaken without complications.



REVIEW OF LITERATURE



REVIEW OF LITERATURE

Vasectomy, a simple procedure, designed to block the passage of sperms through the vas-deferens, was not understood until the 19th century and was not performed as a method of voluntary fertility control until the 20th century. An early reference to vas occlusion was made by the English Surgeon and anatomist JOHN HUNTER in 1775. While performing a dissection, HUNTER noted an obstructed vas-deferens in the cadaver on which he was working. In 1830 HUNTER'S student Sir Astley Cooper began an experimental work on vasectomy using dog. He ligated the artery and vein of spermatic cord on one side without touching the vas; on the other side, he ligated the vas itself. On the side where the artery and vein were obstructed, the testes became gangrenous. On the side where only the vas was obstructed, the tissue- remained healthy and sperms survived in the ductal tract up to the point of ligation. The epididymis, or the convoluted portion of the vas, gradually enlarged to accomodate the sperms.

In 1883 FELIX GUYON, a French Surgeon, concluded that blocking the vas caused atrophy of

the prostate gland. This finding encouraged genito-urinary surgeons of the 1890's to perform vasectomies concurrently with prostate operations in order to reduce the size of the gland and to avoid post-operative epididymitis. One of the first operations is credited to Dr. H. G. Lennander of Upsala, SWEDEN, who in 1897 published a report on his technique.

Dr. Harry Sharp of Indiana (U.S.A.) reported performing a vasectomy in 1899 on a mentally ill patient whose complaint was excessive masturbation. The patient consented to the operation, believing that it would relieve his obsession. The results, undoubtedly psychological, were favourable. In the next ten years, Sharp performed 456 voluntary vasectomies on both healthy and institutionalized men for the purpose of sterilization.

In the early 20th century, vasectomies were, some times, carried out for eugenic reasons on criminals, the mentally ill, the retarded, or those with hereditary diseases. Paradoxically, even as it's contraceptive effects were being documented, the operation was performed by Eugene Steinach, an Austrian exile, for the purpose of over all bodily rejuvenation. From his experiments on rats,

Steinach determined that following ligation of the vas, the sperm producing tissue degenerated while at the same time there was hypertrophy of the hormone producing tissue, which, in it's turn, caused renewed germ cell production. This process was originally thought to counter the effects of aging. Later, Steinach's Hypothesis was refuted, but doctors and scientists continued to advocate the operation for contra ceptive purposes.

As national family planning programmes were initiated in South Asia in the 1950's and 1960's, vasectomies filled the obvious need for a simple, inexpensive birth control technique that could be offered on a one time basis.

Although the number of vasectomies performed throughout the world fluctuates from year to year depending on publicity, national budgets or programme guidelines, the simple procedure of vasectomy has clearly taken it's place as a major technique in voluntary family planning.

In usually practiced method of vasectomy, an incision is made, the vas deferens is exposed, cut, ligated at both ends and then the skin is sutured. The patient has to come for stitch removal after seven days. But there are many complications due to open exposure - ligation of the vas deferens. Post-

operative infection, haematoma, discolouration, swelling, pain, sperm granuloma, epididymitis and psychological effects of an operation and sinus formation occasionally occur. Open method also requires equipment like knife, blade, suture materials, artery forceps etc.

As vas deferens can easily be felt and held through skin, some persons tried to block the vas blindly without making any skin incision. G.S. Sekhon (1970) developed an instrument for percutaneous vasectomy, which encircled the vas and diathermy snare wire was introduced through a special needle. He divided vas as single, double and triple cut. Instead of diathermy division, the vas may be prolapsed, through a small stab wound using another new instrument - a skin-protector in conjunction with vasectome. In contrast to the single cut technique, all the other methods appeared to be quite satisfactory in achieving the objective. The chances of injury to the testicular - artery by the blind diathermy technique must be quite rare, because, the testicular artery is located a little farther away from the vas, with a separate leash of veins in pampiniform plexus. Even if worst comes to worst, still the testicular atrophy need not follow, because of a rich collateral circulation (Keontz 1965).

According to Schmidt et al (1974), fulguration of the lumen of the vas deferens is the optimal method of sealing the cut ends of the vas at vasectomy. Minimum spermatic granulomas have followed in over 1600 cases. However, standard types of electro-surgical units may destroy the full thickness of the vas-wall with resulting complications. A unit has been designed with a power source of a single 22.5 volt dry battery. A bipolar needle is used, so grounding of the patient is unnecessary. Several hundred vasectomies can be done before renewing the battery. Complete destruction of the epithelial layer is obtained with little damage to muscular wall. Neither spermatic granuloma nor failures have resulted.



MATERIAL & METHOD



MATERIAL AND METHODS

First, insulated needles were prepared. Various materials were used, including insulating varnish, Fevicol, Araldite etc., but they all proved unstable. Ultimately in consultation with the dental department, cold curing dental compound was used-Stellon cold-cure acrylic Resin powder and liquid. (Instead, hot cure acrylic resin can also be used but processing is difficult. It needs more time for preparation and setting). Hypodermic, $1\frac{1}{2}$ " long, needles (No. 24) were taken and coated with cold curing dental compound, which consisted of Stellon cold cure acrylic resin powder and liquid. A paste was made and painted over the needle except the tip. After setting, for five minutes, the excess was removed by stone denture finishing. First coarse and then fine grinding stone were used, so that only a thin layer remained and the layer was made tapering, so that it could easily penetrate through the skin.

Various methods were tried for sterilization of these prepared needles-boiling, autoclaving, chemical sterilization by spirit,

Lysol and savlon, ultimately Cidex (R) which consists of 2% glutaraldehyde with Activator, was found most suitable, as it completely sterilized the needles in 15 minutes and did not damage the insulated coating of the needles.

First the method was tried in patients of Benign Prostatic Hypertrophy admitted for definitive surgery, as vasectomy is preliminary requirement for prostate removal. The method was tried in cases where no secondary disease, e.g. Hydrocoele or Hernia etc. were present. Informed consent was obtained and part prepared by shaving and cleansing with Savlon.

The patient was taken to operation theatre and full aseptic technique was used. For anaesthesia, first local infiltration by 1% Lignocaine Hydrochloride was tried but that caused oedema of the tissues and marking of the land marks and made palpation of the vas deferens difficult. Thereafter, anaesthetists were consulted and various drugs were tried and ultimately analgesia was accomplished by intravenous Diazepam (10 mgm.) and Pentazocine, (30 mgm.) given slowly just before the procedure. Immediately patient goes to sleep and does not feel any pain during the procedure. Patient is

usually fully awake in 1/2 hours time and goes back home in 2 hours, fully conscious.

THE TECHNIQUE

The vas deferens on one side was felt and fixed with Babcock tissue forceps. Two babcock forceps were used, one at the upper end and other at the lower end of the scrotum and vas was fixed between the two. The sterilized insulated needle was inserted into the vas deferens and confirmed by moving the needle side to side or up and down movement and at the same time movement of the vas along with the needle was felt. A high frequency current of very short duration was applied through an electro-surgical cautery machine and thus vas was cauterized. The same procedure was done on the other side. The puncture points were sealed with Tincture benzoin. No dressing was applied.

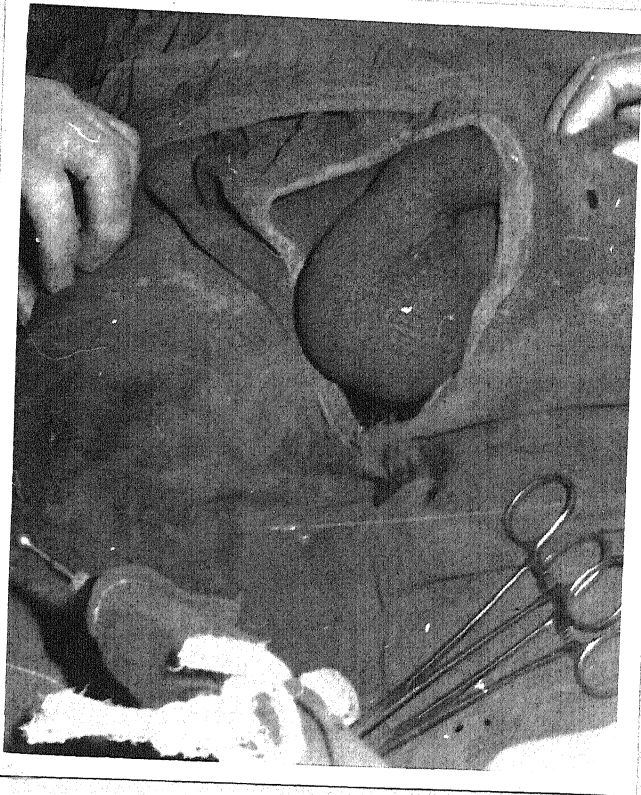
Analgin tablets were given for 1-2 days. No antibiotics were given. After 24 hours of the procedure, patients developed round nodules of about 3/4 cm. diameter at the point of cautery on the vas deferens. No infection etc. occurred and patients were quite comfortable, except slight pain for 1-2 days. The nodules disappeared after 5 to 7 days.

At the time of definitive surgery for Benign Prostatic Hypertrophy, before doing Prostatectomy, vas was exposed through longitudinal incision over the scrotum. About 1" of the vas was removed (cauterized area in the middle), on the both sides and wound was sutured and sealed with Tincture benzoin before starting prostatectomy, in order to avoid contamination of wound by urine.

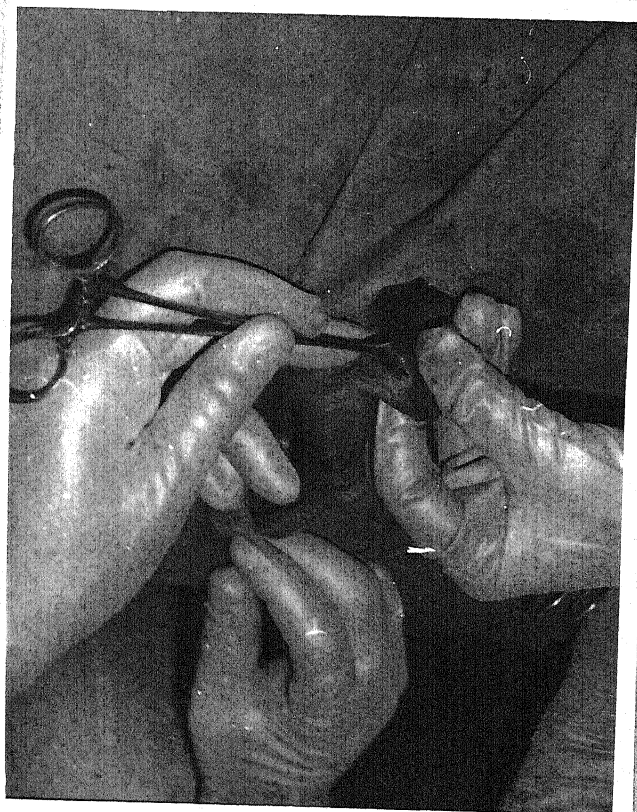
Injection of saline was done through the lumen of the resected vas to see the patency. In some cases, vas was found to be completely divided into two portions. Histopathology was done of all vas segments thus removed.

The same technique was used for patients, who come for voluntary vasectomy to this hospital. A proforma was prepared, which enlisted full details of the patients. Preoperative seminogram was done. Injection Diazepam (10 mgm.) and Pentsaccine (30 mg.) Intravenous were given and vas was cauterized. In these cases, each vas was cauterized at two separate points at 1 c.m. distance from each other to minimize chances of failure. Patient was called, next day and invariably nodule formation was noted. There was slight pain for 1-2 days and one

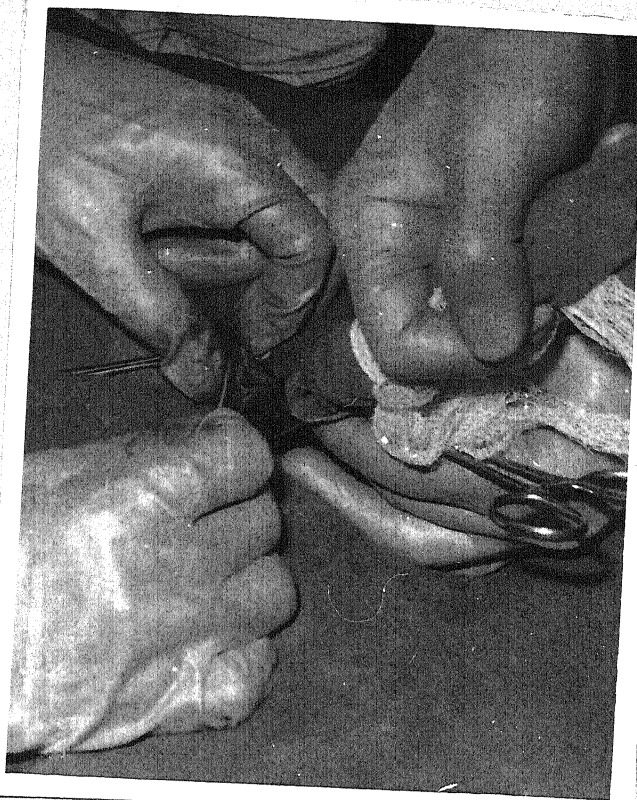
analgin tablet twice a day was sufficient. No antibiotics or other drugs were given. Nodules dissolved in one weeks time. Post operative semino-gram was done at 2 weeks, one and 2 monthly intervals. Condomes were supplied for 3 months to each patient and patient was instructed not to indulge in sexual inter course without condoms till instructed otherwise.



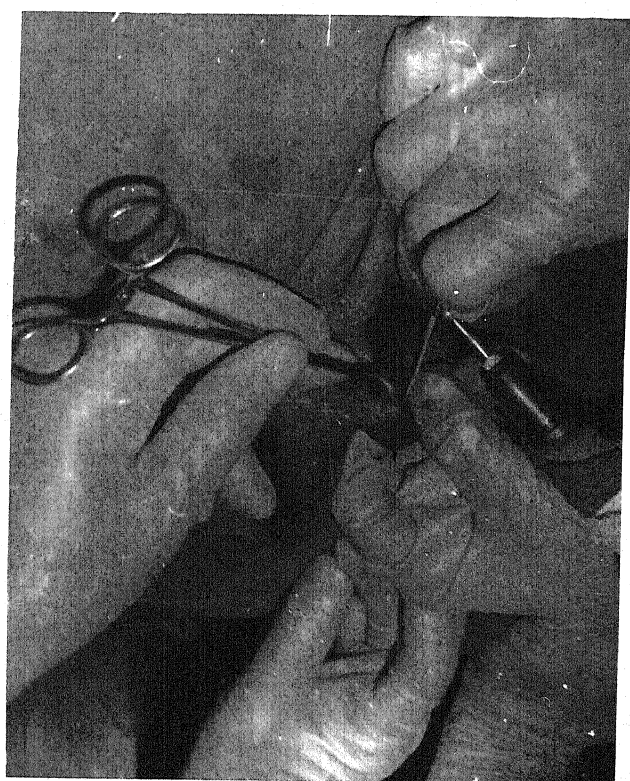
Photograph No.1: Showing
scrotum painted and
drapped, with cautery
and Babcock's forceps.



Photograph No.2:
Showing fixation of
vas with Babcock's
forceps.



Photograph No.3: Showing
insulated needle inserted
into the vas.



Photograph No.4:
Showing fulguration
of vas through
electro-surgical
cautery.



OBSERVATIONS



O B S E R V A T I O N

This study was first carried out in patients of Benign Prostatic Hypertrophy, waiting for definitive surgery. It was done in 18 patients admitted in M.L.B. Medical College, Hospital, Jhansi from May, 1981 to May, 1982. It was then tried in 28 patients of voluntary vasectomies as one time and out patient basis.

Table No. 1

Showing Age distribution of patients of Benign Prostatic Hypertrophy undergoing percutaneous fulguration of vas deferens.

Serial No.	Age-group (years)	Number of the patients	Percentage
1.	50-55	2	11.11%
2.	55-60	5	27.78%
3.	60-65	7	38.89%
4.	65-70	3	16.66%
5.	70-75	1	5.56%
6.	75-80	-	-
		18	100%

The maximum number of patients undergoing fulguration was in age group 60-65 years, and constituted 38.89% and the minimum in age group 70-75 years i.e. 5.56%.

Table No.2

Showing the findings at the time of exposure of vas deferens before starting definitive Prostatectomy.

Serial No.	Findings at the exposure of vas	Number of patients	Percentage
1.	Complete division of vas deferens	5	27.78%
2.	Nodule	6	33.33%
3.	Fibrosis	7	38.89%
4.	Any others	-	0%
		18	100%

There was complete division of vas deferens in 27.78% of cases while fibrosis was noted in 38.89% of cases and the nodules were found in 33.33% of cases. The cases having fibrosis were the maximum. The exposure of vas of these cases was done after 7 to 10 days of the fulguration.

Histopathology of the resected vas showed; coagulative necrosis with hyalinization of the vas with fibrosis and occlusion of the lumen; mild mononuclear infiltration was also seen around the vas.

Table No.3

Showing the age-incidence of patients undergoing the percutaneous fulguration of vas as a method of permanent fertility control measure:

Serial No.	Age (Years)	Number of the patients	Percentage
1.	16-20	-	-
2.	20-30	10	35.71%
3.	30-40	13	46.43%
4.	40-50	5	17.86%
5.	50-60	-	-

The maximum number of cases were in age-group 30-40 years, and constituted 46.43%. The number of cases was less in age groups 40-50 years and in 20-30 years.

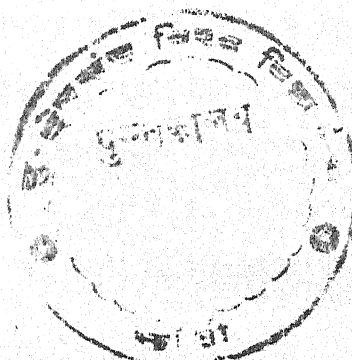


Table No.4

Showing the Socio-economic status of the patients, who accepted this method of permanent fertility control measure;

Serial No.	Socio-economic status	Number of the patients	Percentage
1.	Lower Income Group	5	17.86%
2.	Middle Income Group	18	64.28%
3	Higher Income Group	5	17.86%

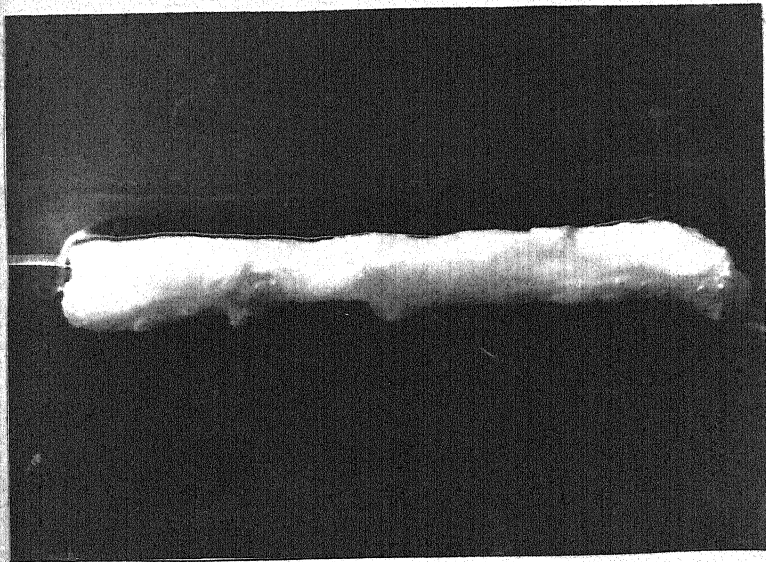
The socio-economic status of the patients was recorded, based on the social classification of Indian families, recently brought forth by Srivastava et al (1981). The middle income group was constituting 64.28%, whose mean monthly per capita income range from Rs. 61 to Rs. 599. The higher and lower income groups were equal in number, constituting 17.86% each. Patients having mean monthly per capita income of Rs. 600/- or above were put in higher income group while those having less than Rs. 60 mean monthly per capita income were put in lower socio-economic status.

Table No. 5

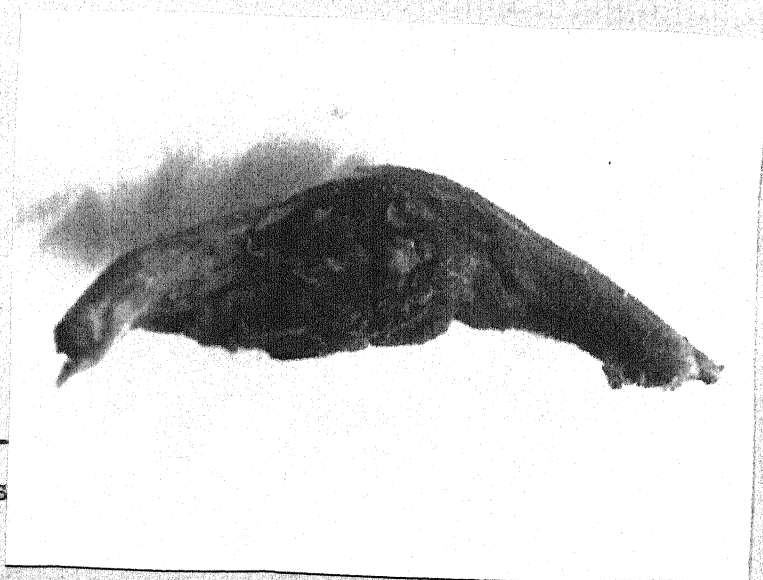
Showing the number of children
at the time of accepting birth control measures:

Serial No.	Number of the patients	Number of Child/Children	Perce- tage
1.	12	2	42.86%
2.	7	3	25%
3.	6	4	21.43%
4.	3	5	10.71%
<hr/>			
28			
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42.86% of cases had 2 children
at the time of fulguration of vas, 10.71% of cases
had 5 children which is nearly 4 times less than
the optimum time for family planning measures to
check the fertility, 25% of cases had 3 children
and 21.43% had 4 children at the time of accepting
this method.



Photograph No.5: Showing
normal segment of vas.



Photograph No.6:
Showing fulgurat-
ed segment of vas

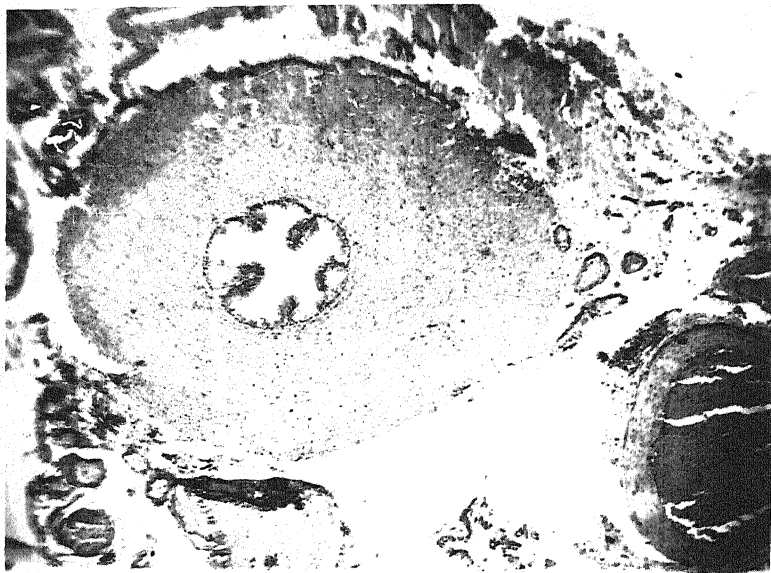


Fig.1:Microphotograph of a normal vas. The lumen is lined by a single layer of columnar epithelial cells. H.E.x70.

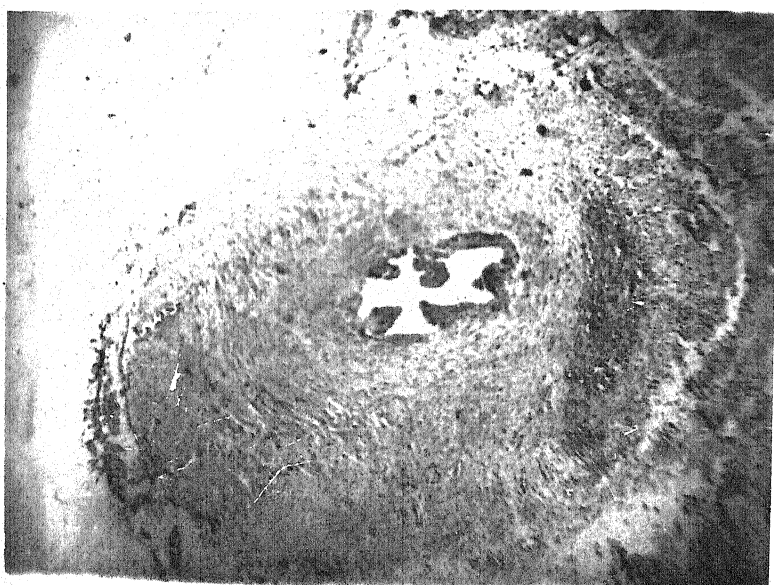


Fig.2:Microphotograph of vas from a patient 3 days after cauterization showing an area of haemorrhage in the wall, the lumen is narrowed down and the epithelial lining shows multiple layering of epithelial lining cells. H.E.x70.

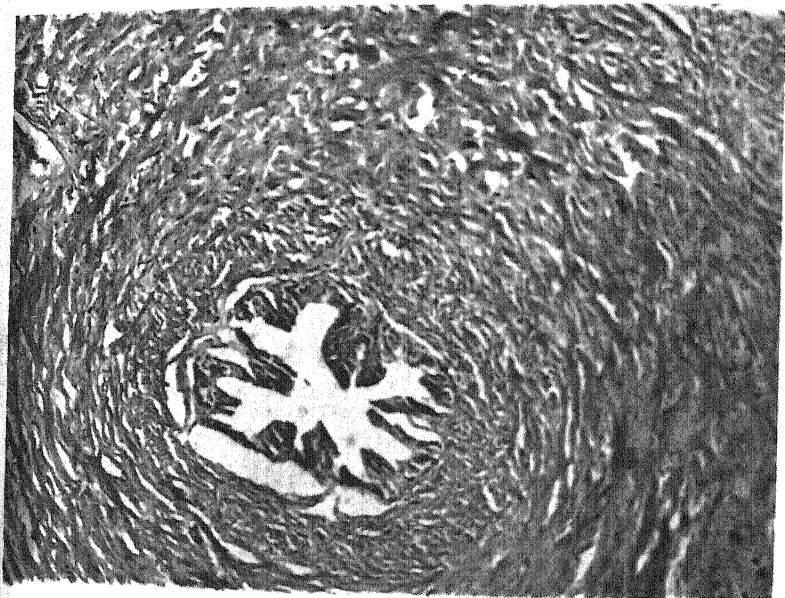


Fig.3:Microphotograph of a vas from a patient 10 days after cauterization showing hyalinization in the wall (left) along with narrowing of the lumen with multiple layering of epithelial lining cells. HE x 280.

4:Microphotograph of a vas from a patient 10 days after cauterization showing marked narrowing of the lumen with multiple layering of epithelial lining cells HE x 280.

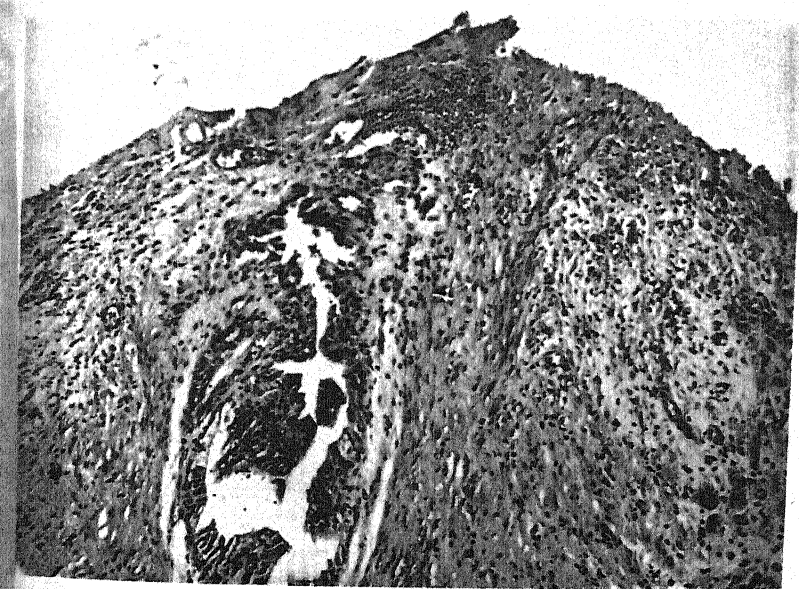
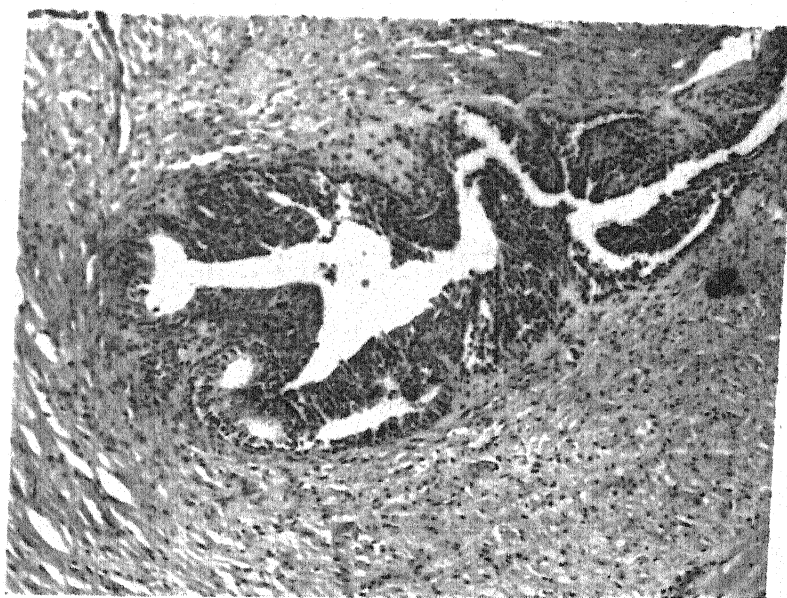


Fig.5:Microphotograph of a vas from a patient 10 days after cauterization showing occlusion of the lumen with presence of a granulomatous lesion in the wall (left) HE x 280.



DISCUSSION



DISCUSSION

The study conducted in M.L.B. Medical College, Hospital, Jhansi for the male fertility control measure, is based on a new technique, in which vas is fulgarized by an insulated needle through intact skin, without open operation.

First the method was tried in the patients of Benign prostatic Hypertrophy waiting for definitive surgery where vas occlusion is usually required to prevent Post operative epididymitis.

At the time of definitive surgery for Benign prostatic Hypertrophy, 7-10 day later, vas was resected and Gross examination was made. It was seen that in all cases, vas occlusion was successful. In few patients, there was complete bisection of vas and in others, there was fibrous nodule and fibrosis.

Clinically it was tried in 28 cases who volunteered for family planning. The cases were followed up for up to 3 months. Seminograms were done at fortnightly interval.

In all cases, except 2, there was azoospermia. There was failure in 2 cases and thickening of the cord in one and haematoma in one case. As this is the beginning of the trial, it is hoped that with more experience and refinement of technique the failure rate and complication rate will still be lower. The technique is simple, requires no cutting or stitching and thus will save on money spent. No antibiotics or other drugs were needed after the procedure and there was only need for Analgin tablets for 1-2 days. Otherwise surprisingly, patients felt very comfortable and no infection or other problems arose. Thus this technique, if proved successful, will be very useful for mass family planning campaigns as no equipment except insulated needle and an electro-surgical cautery machine is required.

Our preliminary observations indicate that this technique can be a good means of vas occlusion for mass family planning campaigns.



SUMMARY & CONCLUSION



S U M M A R Y A N D C O N C L U S I O N

The clinical study of " Percutaneous fulguration of vas", in a series of 18 cases of Benign Prostatic Hypertrophy and 28 cases of voluntary vasectomy was carried out in M.L.B. Medical College Hospital, Jhansi from May, 1981 to May, 1982.

First the insulated needles were prepared. Hypodermic 24 gauge needles were pasted, with Stallon cold cure acrylic resin liquid and powder. Needle tip was kept bare, to be inserted into the vas sparing the skin and it was sterilized by cidex (R).

Selected cases of Benign Prostatic Hypertrophy were taken, having no secondary diseases like hernia or hydrocoele etc.

In 18 cases of Benign Prostatic Hypertrophy. the fulguration of vas done on both sides of vas prior to definitive surgery through an electro-surgical cautery. The vas were fixed by two babcock forceps.

At the time of definitive surgery the vas thus cauterized was removed. Gross examination was done. This showed the luminal occlusion of vas at the site of coagulation diatery and proved by injecting

saline solution. Microscopy was done which showed the luminal occlusion by coagulative necrosis, fibrosis and mononuclear infiltration around the fulgurated part.

Then, the technique was tried in cases of vasectomy who volunteered. The vas was cauterized on both sides. Patients were sent back home the same day and asked not to indulge in sexual activity without condoms. Every fortnightly, the Seminogram was done. At 1½ months time all proved to be azoospermic excepting initial 2 cases whose semen showed normal sperm count through out follow up.

There were no complications except haematoma in one case which subsided after a week of rest and thickening of cord in one case.

The technique appeared to be very simple and with little or no complications as compared to other routine methods of vasectomy. With further trials, the procedure may prove to be the most popular and easily acceptable to the Indian community, since, there is no open operation or stitch removal, this technique alleviates the fear of an operation. The technique can be applied to masses in large scale family planning campaign in the field without fear of tetanus and associated morbidity.

Since small area of vas is destroyed through electro-surgical cautery as opposed to a segment of vas in routine vasectomy, recanalization will be easier to perform if required at a later date.



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PERCUTANEOUS FULGURATION
OF VAS**

SUMMARY

THESIS

FOR MASTER OF SURGERY

**BUNDELKHAND UNIVERSITY
JHANSI UTTAR PRADESH**



1983

NARENDRA SINGH BHAT

S U M M A R Y

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At the time of definitive surgery the vas thus cauterized was removed. Gross examination was done. This showed the luminal occlusion of vas at the site of coagulation diathermy and proved by

injecting saline solution. Microscopy was done which showed the luminal occlusion by coagulative necrosis, fibrosis and mononuclear infiltration around the fulgurated part.

Then, the technique was tried in cases of vasectomy who volunteered. The vas was cauterized on both sides. Patients were sent back home the same day and asked not to indulge in sexual activity without condoms. Every fortnightly, the Seminogram was done. At 1½ months time all proved to be azoospermic excepting initial 2 cases whose semen showed normal sperm count through out follow up.

There were no complications except haematoma in one case which subsided after a week of rest and thickening of cord in one case.

The technique appeared to be very simple and with little or no complications as compared to other routine methods of vasectomy. With further trials, the procedure may prove to be the most popular and easily acceptable to the Indian community, since, there is no open operation or stitch removal, this technique can be applied to masses in large scale family planning campaign in the field without fear of tetanus and associated morbidity.